

“Ozone – The Good, the Bad and the Ugly”

Air Quality in South Carolina



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Our mission...

- To conserve and enhance South Carolina's air resources in a manner that promotes quality of life.



Air Planning, Development & Outreach (DAPDO)

- Regulation Development
- Regional and National Planning
- Information Services
- Mobile sources
- Training

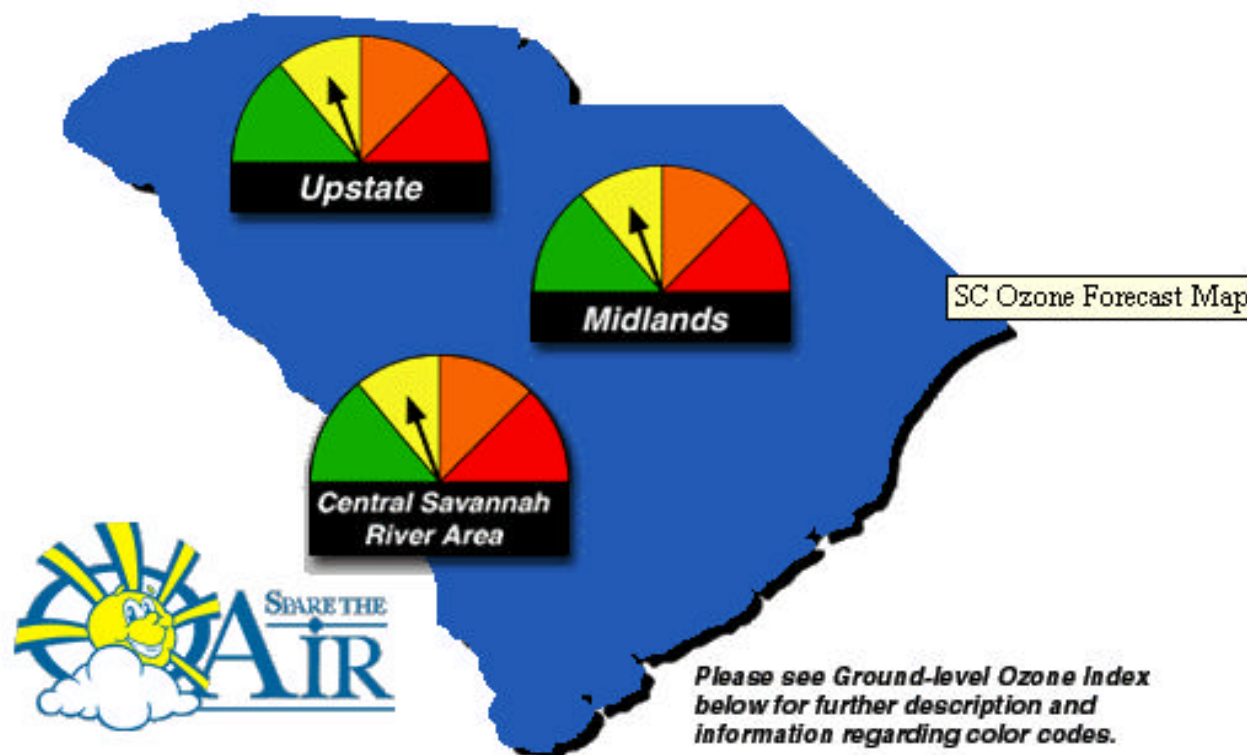
Informing The Public About Their Air Quality



What is Spare the Air?

- A voluntary, proactive campaign to address air pollution
- Partnership between Government, Industry, and Environmental Groups
- Key Components:
 - Ozone Monitoring
 - Ozone Forecasting
 - Media (TV, radio, print)
 - SCDOT signs
 - Alert Network (email & FAX)
 - Website

South Carolina Ozone Forecast for Thursday, May 11, 2000



Air pollution

...occurs when certain gases or particulate matter in the air affect the health of humans, animals, plants or damage materials.

What is Air Pollution?

- Ⓒ Public health problem to humans and other living things
- Ⓒ Modern air pollution began in 18th century England with the Industrial Revolution
- Ⓒ 6 of every 10 Americans live in areas that do not meet the EPA air quality standards

How Do We Know What is in the Air?

- ⌄ Statewide Monitoring System

- ⌄ Permitting Process

- ⌄ Control devices

 - ⌄ Bag Houses

 - ⌄ Scrubbers

 - ⌄ Cyclones

 - ⌄ Incinerators

 - ⌄ Vapor Recover
Unit

Air Pollution Sources...?

Natural Sources

Forest Fires



Biogenic



Volcanic Activity



Agricultural Sources

- Chemicals from pesticide sprays
- Particulate matter from harvesting

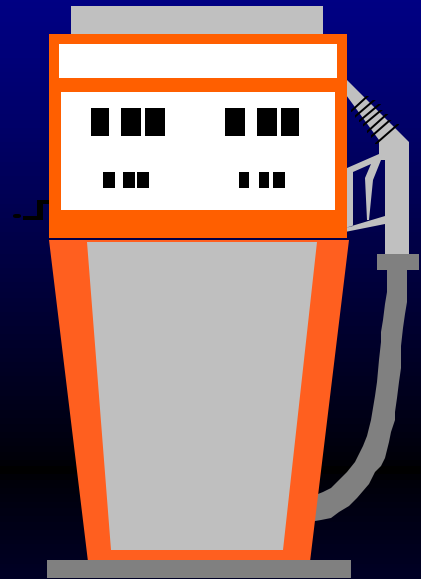
Stationary Sources

- Power Plants
- Paper Mills
- Steel Mills
- Chemical Manufacturers
- Oil Refineries
- ...large industries in general.



Area Sources

- Dry Cleaners
- Print Shops
- Gas Stations
- Gas-powered lawn equipment
- Everyday materials - e.g., paint, lighter fluid, aerosol sprays, cleaning fluids



Mobile Sources

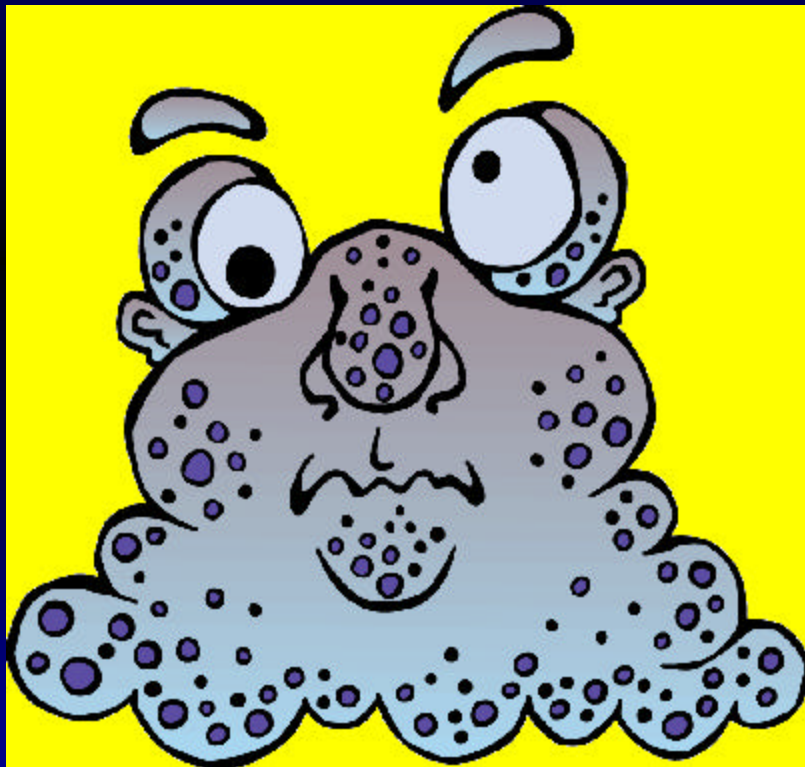
- Passenger Cars
- Buses
- Trucks
- Trains
- Airplanes
- Construction Equipment



*Primary source of air pollution in South Carolina

Criteria Pollutants

Ozone (O_3)



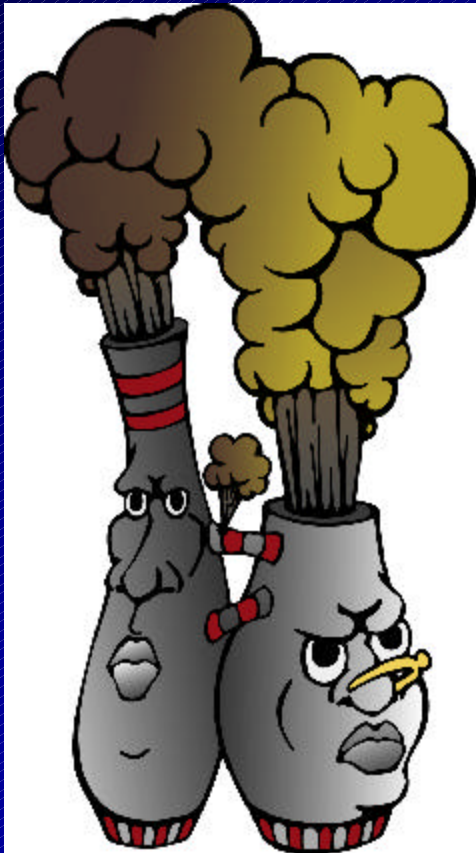
- Health Effects
 - impaired mechanical function of the lungs
 - respiratory symptoms in individuals with respiratory diseases
 - headache
 - irritant to mucous membranes of eyes and throat

Carbon Monoxide (CO)



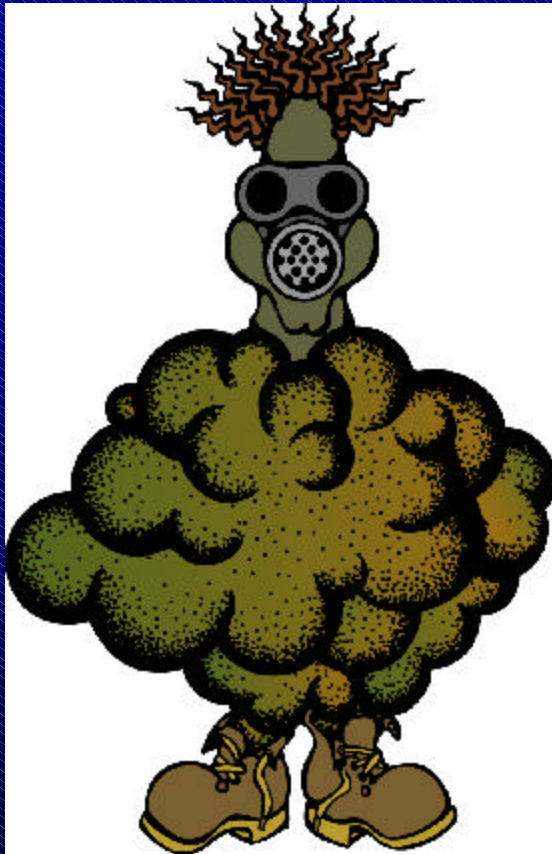
- Health Effects
 - headaches
 - decreased exercise capacity
 - pregnant women and those with cardiovascular disease especially susceptible

Nitrogen Dioxide (NO₂)



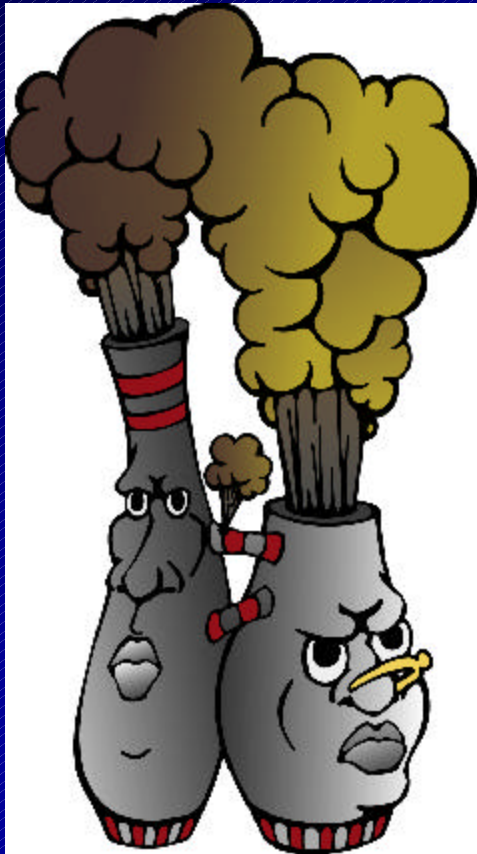
- Health Effects
 - increased susceptibility to respiratory infections
 - increased breathing difficulties for those with respiratory diseases such as asthma

Particulate Matter (PM)



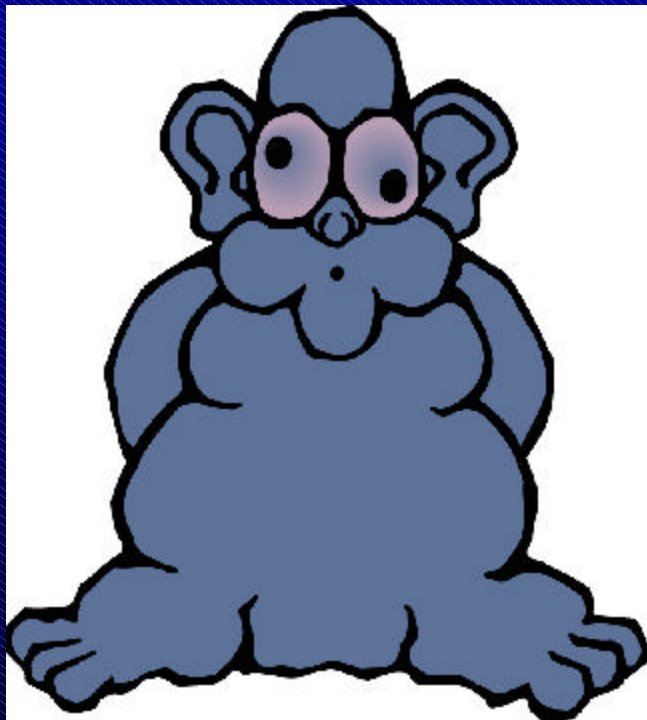
- Health Effects
 - reduced lung function
 - aggravation of respiratory ailments
 - long-term risk of increased cancer rates

Sulfur Dioxide (SO₂)



- Health Effects
 - aggravation of respiratory tract
 - impaired lung function

Lead (Pb)



- Health Effects
 - impaired production of hemoglobin
 - intestinal cramps
 - peripheral nerve paralysis
 - anemia
 - severe fatigue

Toxics



- Health Effects
 - asthma
 - chronic bronchitis
 - kidney/liver damage
 - skin rashes
 - developmental problems
 - nervous system damage
 - cancer

What is Ozone?

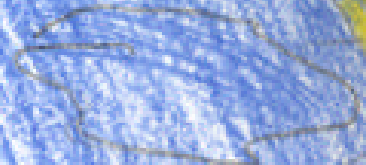
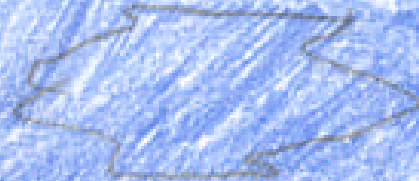
- Ozone is not emitted by any car, truck, or power plant.
- Definition- A highly reactive compound containing three oxygen atoms which is formed when an oxygen atom is cleaved by natural ultraviolet light from nitrogen dioxide and combines with two oxygen atoms.
- Volatile Organic Compounds(VOCs) also are involved in the ozone formation.



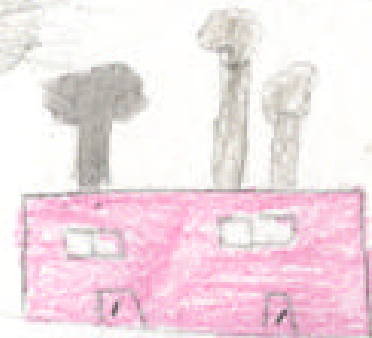
I thought ozone was good?

- Stratospheric Ozone - Beneficial layer of naturally occurring ozone 10 - 35 miles above the earth. Reduces exposure to UV radiation from the sun.
- Ground-Level Ozone - Prime ingredient of smog in larger cities. Negative health and environmental effects.

Good Ozone



Bad Ozone

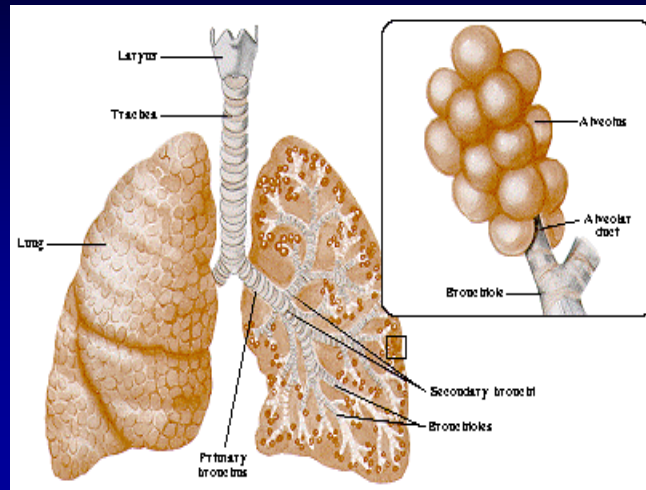


What are the health and environmental concerns of ground-level ozone?

- Irritates lungs
- Increases susceptibility to respiratory illnesses
- Interferes with plant growth and reduces agricultural crop yield
- Damages the foliage of trees and reduces forest productivity

Ground-level Ozone is BAD!

- Aggravated asthma
- Inflammation of lung tissue
- Impair the body's immune system defenses
- Interferes with plant growth
- Reduces agricultural crop yield



EPA Air Quality Index (AQI) for ground level ozone.

Based on the new, more stringent 8-hr EPA standard

Green denotes **GOOD** air quality (below standard).

Yellow denotes **MODERATE** air quality (also below standard).

Orange & Red **APPROACH** and **EXCEED** unhealthy (above standard).

|  Air Quality Guide | | |
|--|--|--|
| Color Coded Index | Weather Conditions | Recommended Actions |
| Unhealthy | <ul style="list-style-type: none">Hot (middle 90's to 100's), hazy and humidStagnant airLittle chance of rainStationary high pressure system with sunny skies | <p>When air quality reaches unhealthy levels:</p> <ul style="list-style-type: none">Children and elderly individuals should reduce outdoor activities.Healthy individuals should limit strenuous outdoor work or exercise, particularly between 1pm-7pm.Individuals with heart or respiratory ailments, emphysema, asthma, or chronic bronchitis should limit their outdoor activities. If breathing becomes difficult, move indoors. <p>When air quality is forecast to reach unhealthy levels, citizens are strongly urged to:</p> <ul style="list-style-type: none">Limit driving and, when possible, combine errands.Use area bus and rail lines, or share a ride to work.Avoid mowing lawns with gasoline powered mowers. |
| Approaching Unhealthy | <ul style="list-style-type: none">Temperatures in the upper 80's to low 90'sLight windsSlow moving high pressure system with sunny skies | <p>When air quality approaches unhealthy levels, citizens are urged to:</p> <ul style="list-style-type: none">Avoid mowing lawns with gasoline powered mowers.Carpool and/or take public transportation, when possible.Avoid refueling automobiles on days when levels of smog are predicted to be high. |
| Moderate | <ul style="list-style-type: none">Mild summer temperatures (upper 70's to mid 80's)Light to moderate winds (15 knots or less)High pressure system with partly cloudy or sunny skies | <p>When air quality is in the moderate range, citizens should:</p> <ul style="list-style-type: none">Consolidate automobile trips and errands.Limit car and truck idling when possible.Conserve electricity and set air conditioners to 78° F.Refuel cars after dusk. |
| Good | <ul style="list-style-type: none">Cool summer temperatures (mid 70's to low 80's)Windy conditions (15-20 knots or higher)Heavy or steady rainPassing cold front carries pollution out of area | <p>Throughout the ozone smog season (May through September), citizens should make an extra effort to minimize air pollution emissions:</p> <ul style="list-style-type: none">Follow refueling use instructions for efficiency of vapor recovery systems, and do not top off the tank.Carpool, use mass transit, bike, or walk when possible.Keep cars and boats tuned-up.Use environmentally safe paints and cleaning products.Make sure the car's gas cap fits properly. |


Air Quality Hotline (800) 821-1237

♻️ Printed on recycled paper

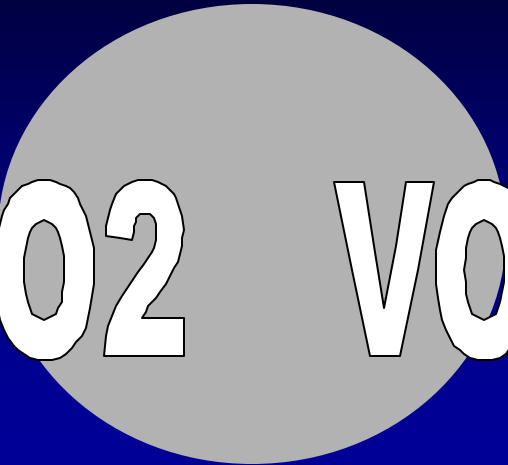
From where does Ozone come?

- Nitrogen Dioxide-combustion of fossil fuels
 - Transportation
 - Utilities
 - Industry
- Volatile Organic Compounds-solvents
 - Biogenic (Natural)
 - Transportation
 - Industry

Ozone is made like cheese toast...

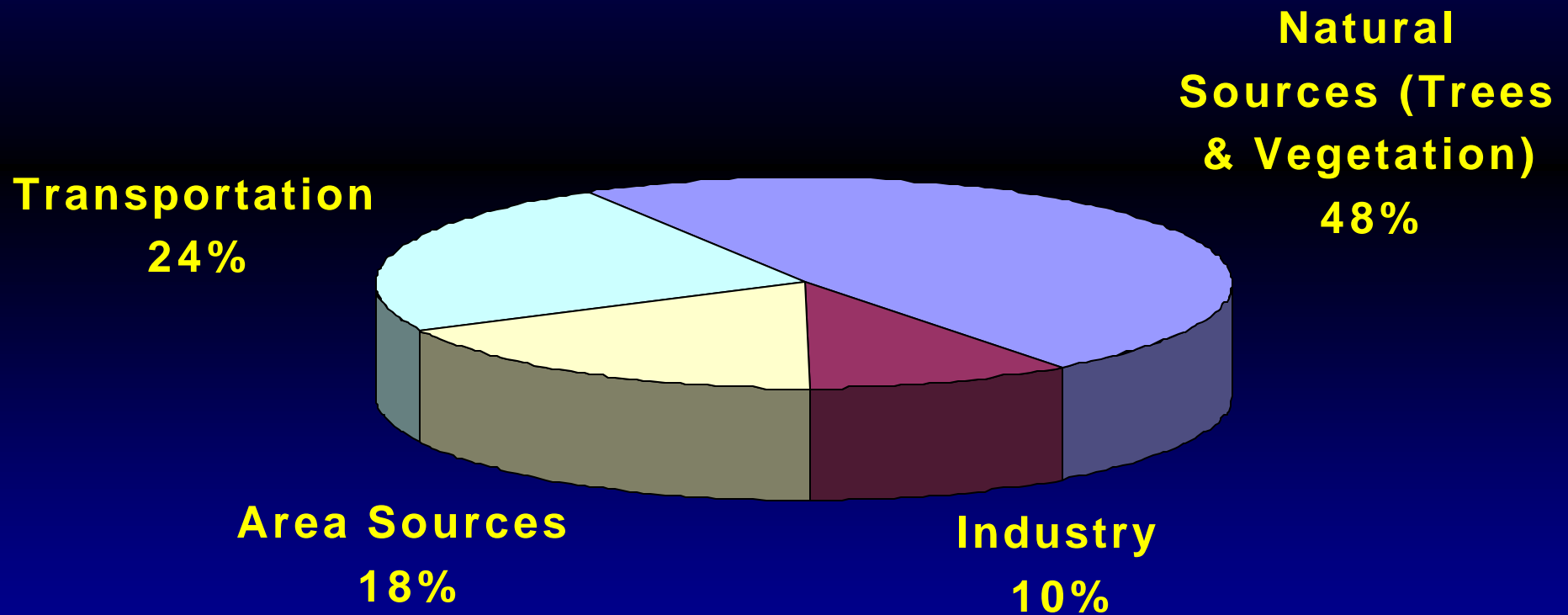


Bread Cheese



NO2 VOC's

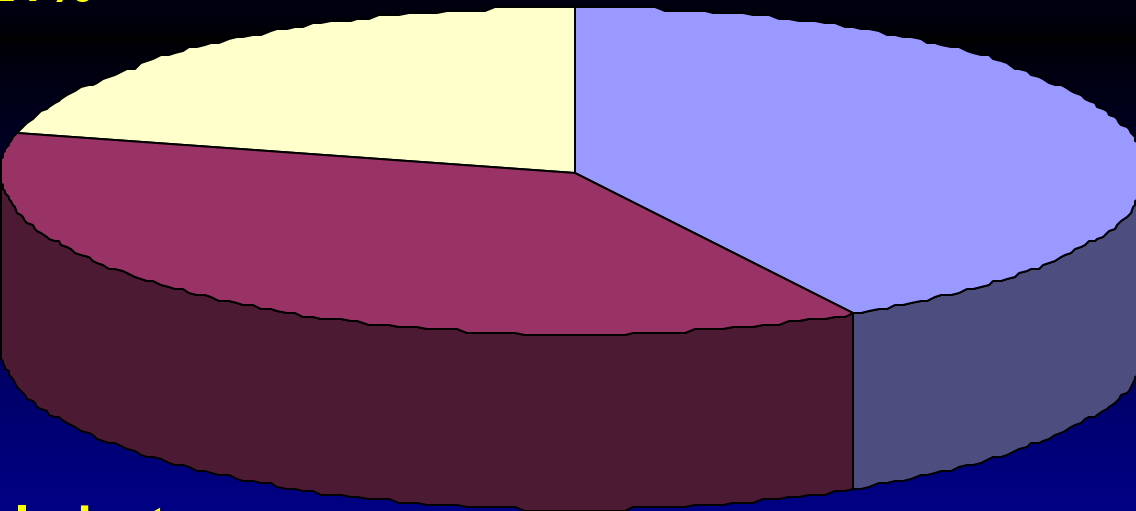
VOC Sources in South Carolina



NO_x Sources in South Carolina

Area Sources
21%

Transportation
42%



Industry
37%



How Can Individuals Reduce Ozone?

- Reduce use of our cars
 - Car pool
 - Combine trips
 - Mass transit
- Keep all motorized equipment in good operating condition
- Use less electricity
- Refuel vehicles and use lawn equipment after 6:00 pm



“Tomorrow Please Carpool”



Indoor Air Quality (Continue)

- The Bureau does have a contact who can answer questions and provide resources.
- Has a webpage for homeowners:
www.scdhec.net/baq

Indoor Air Contact:

Dianne Minasian (803) 898-4467

Email: minasids@dhec.state.sc.us

Indoor Air Quality

- Indoor air is not an area regulated by the Bureau of Air Quality, nor do we have the resources to perform the necessary testing.
- At this time, there are no State or Federal laws which provide this Bureau any authority to identify or remedy IAQ complaints.

Air Quality Information Resources

- Bureau of Air Quality
(803) 898-4123
- www.scdhec.net/baq

